
Human Satellite Cell Isolation and Xenotransplantation.

Journal:	Methods Mol Biol
Publication Year:	2017
Authors:	Steven M Garcia, Stanley Tamaki, Xiaoti Xu, Jason H Pomerantz
PubMed link:	28842905
Funding Grants:	Characterization of Human Skeletal Muscle Stem Cells for Clinical Application

Public Summary:

This report publishes methods for purifying satellite cells from human muscle samples, and for transplanting satellite cells into immunodeficient mice. The methods enable muscle researchers to more readily perform research with human muscle stem cells.

Scientific Abstract:

Satellite cells are mononucleated cells of the skeletal muscle lineage that exist beneath the basal lamina juxtaposed to the sarcolemma of skeletal muscle fibers. It is widely accepted that satellite cells mediate skeletal muscle regeneration. Within the satellite cell pool of adult muscle are skeletal muscle stem cells (MuSCs), also called satellite stem cells, which fulfill criteria of tissue stem cells: They proliferate and their progeny either occupies the adult MuSC niche during self-renewal or differentiates to regenerate mature muscle fibers. Here, we describe robust methods for the isolation of enriched populations of human satellite cells containing MuSCs from fresh human muscle, utilizing mechanical and enzymatic dissociation and purification by fluorescence-activated cell sorting. We also describe a process for xenotransplantation of human satellite cells into mouse muscle by injection into irradiated, immunodeficient, mouse leg muscle with concurrent notexin or bupivacaine muscle injury to increase engraftment efficiency. The engraftment of human MuSCs and the formation of human muscle can then be analyzed by histological and immunofluorescence staining, or subjected to in vivo experimentation.

Source URL: <https://www.cirm.ca.gov/about-cirm/publications/human-satellite-cell-isolation-and-xenotransplantation>